

Course Title: Intense Beam Physics: Space Charge, Halo, and Related Topics  
US Particle Accelerator School, January 19-30, 2004, Williamsburg, Virginia

Course Instructors: John J. Barnard (JB) and Steven M. Lund (SL), Lawrence Livermore National Laboratory  
Discussion section leader/grader: Edwin Chacon-Golcher (ECG), Los Alamos National Laboratory

Monday 1/19		Tuesday 1/20		Wednesday 1/21		Thursday 1/22		Friday 1/23	
9:00 am to 10:30 am	Organization/intro Envelope equations JB	Env. eqs./ Current limits JB	Injectors/Longitudinal bem physics I JB	Longitudinal beam physics II JB	Longitudinal beam physics III. JB				
10:30 am to 12:00 noon		Particle equations of motion II SL	Transverse distribution funcs. I SL	Transverse distribuition funcs. II SL	Simulation techniques I SL				
12:00 noon to 1:00 pm	Lunch	Lunch	Lunch	Lunch	Lunch				
1:00 pm to 2:00 pm	Particle equations of motion I (cont) SL	Particle eqs. of mot. II SL	Transv. dist. funcs. SL	Trans. dist. functions. SL	Sim. techs. SL				
2:00pm to 3:00 pm		Recitation ECG	Recitation ECG	Recitation ECG	Recitation ECG				
3:00 pm to 4:00 pm									

Evenings 6-?	Homework	Homework	Homework	Homework
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Monday 1/26		Tuesday 1/27		Wednesday 1/28	Thursday 1/29	Friday 1/30	
9:00 am to 10:30 am	Pressure/scattering/ electron effects JB	Modes in continuous focusing/ halo JB	Heavy ion fusion/ Final focusing JB	Review of material JB	Trans. kinet. stability		
					Circular accelerators SL		
10:30 am to 12:00 noon	Simulation techniques II SL	Transverse centroid & envelope eqns. SL	Transverse centroid & envelope eqns. SL	Transverse kinetic and fluid stability SL	Final Exam Review JB/SL		
12:00 noon to 1:00 pm	Lunch	Lunch	Lunch	Lunch			
1:00 pm to 2:00 pm	Sim. techs. II SL	Envelope modes SL	Envelope modes SL	Trans. kinet. and fluid stability SL			
2:00pm to 3:00 pm	Recitation ECG	Recitation ECG	Recitation ECG	Recitation ECG			
3:00 pm to 4:00 pm	Computer Lab SL ECG						
4:00 pm to 5:00 pm							

Evenings 6-?	Homework	Homework	Homework	Take-home final
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8 - 10pm	Computer lab			
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Homework: collaboration with other students in class, and hints from grader or instructors allowed.

Take-home final: no collaboration allowed